S/N: 10/708,567

Boskamp ct al.

## In the Claims

- 1. (Original) An MR coil assembly comprising:
- a volume coil arrangement situated to generate a polarized field about a subject to be imaged;
- multiple drive ports connected to a common end of the volume coil arrangement; and
- multiple drive cables connectable to a voltage source at one end and connected to the multiple drive ports at another end to apply voltages to the multiple drive ports such that the volume coil arrangement generates a substantially circular polarized field independent of subject asymmetry.
- 2. (Original) The assembly of claim 1 further comprising fewer drive cables than drive ports.
- (Original) The assembly of claim 1 further comprising a balun connected to each drive port.
- 4. (Original) The assembly of claim 3 further comprising a splitter connected to each drive cable and a pair of baluns.
- 5. (Original) The assembly of claim 4 wherein each drive port is connected to receive a voltage that is 90 degrees out-of-phase from a voltage applied to a neighboring drive port.
- 6. (Original) The assembly of claim 1 wherein the common end of the volume coil arrangement is a superior end-ring of the volume coil arrangement.
- 7. (Original) The assembly of claim 1 wherein the volume coil arrangement includes sixteen coil elements arranged in a birdcage configuration.
- 8. (Original) The assembly of claim 2 wherein the multiple drive ports include four drive ports and the multiple drive cables include two drive cables.

S/N: 10/708,567

Boskamp et al.

9. (Original) The assembly of claim 1 wherein the volume coil arrangement is constructed such that a center thereof is not a virtual ground plane.

## 10. (Original) An MRI apparatus comprising:

a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR data from a subject, the RF coil assembly having:

a plurality of RF coils arranged in a birdcage arrangement to transmit RF energy toward the subject at least partially positioned in a volume-of-interest; and

a number of drive ports to receive an applied voltage to drive the plurality of RF coils and maintain a substantially circular polarized field about the volume-of-interest independent of subject contact with the RF coil assembly.

- 11. (Original) The MRI apparatus of claim 10 wherein the RF coil assembly includes a balun electrically connected to each drive port to couple balanced and unbalanced inputs.
- 12. (Original) The MRI apparatus of claim 11 further comprising at least one splitter, each splitter electrically connected to apply a phase-shifted voltage input to each balun of a pair of baluns.
- 13. (Original) The MRI apparatus of claim 12 further comprising a pair of voltage inputs, a first input electrically connected to a first splitter and a second input electrically connected to a second splitter.
- 14. (Original) The MRI apparatus of claim 13 wherein the first input is 90 degrees out-of-phase from the second input.
- 15. (Original) The MRI apparatus of claim 11 wherein each splitter is constructed to perform a ± 90 degree phase shift of a voltage input.

Boskamp et al.

S/N: 10/708,567

- 16. (Original) The MRI apparatus of claim 10 wherein the birdcage arrangement includes an inferior end-ring and a superior end-ring, and wherein the number of drive ports are connected to only one of the inferior end-ring and the superior end-ring.
- 17. (Original) The MRI apparatus of claim 10 wherein a drive port is configured to be driven by an input that is 90 degrees out-of-phase of an input applied to a neighboring drive port.
- 18. (Original) The MRI apparatus of claim 10 wherein the RF coil assembly includes four drive ports and sixteen RF coil elements.
- 19. (Previously Presented) A method of driving coils of an MR coil assembly to reduce subject asymmetry input in a polarized RF field independent of subject asymmetry, the method comprising the steps of:

providing a pair of power inputs;

splitting each power input into a pair of driving inputs;

inputting each driving input to a balun; and

inputting an output of each balun to a respective MR coil drive port that is connected to more than one coil of an MR coil assembly for generation of an RF field about a volume-of-interest.

- 20. (Original) The method of claim 19 further comprising the step of splitting each input such that the driving inputs are shifted 90 degrees out-of-phase from one another.
- 21. (Original) The method of claim 19 further comprising the step of inputting a first driving input of a pair of driving inputs to a first balun and inputting a second driving input of the pair of driving inputs to a second balun, and wherein the first balun is electrically connected to a drive port that is not a neighbor of a drive port connected to the second balun.
- 22. (Original) The method of claim 19 further comprising the step of impedance matching the pair of voltage inputs before inputting the driving inputs to respective baluns.

Boskamp et al.

S/N: 10/708,567

23. (Original) The method of claim 19 wherein the RF coil assembly includes sixteen coils arranged in a birdcage coil arrangement, and wherein each MR coil assembly drive port is connected on a common end-ring.